



Fire Resistant Materials

In atmospheres containing a high percentage of oxygen under pressure—such as a manned spacecraft—fire hazard is greater than normal. After a 1967 Apollo fire, NASA intensified its fire safety research and sought new fire-retarding materials for greater protection of astronauts in an oxygen-rich environment. Under contract with Johnson Space Center, several companies developed new and improved materials. Among them was a chemically-treated fabric called Durette®—developed by Monsanto Company, St. Louis, Missouri—which will not burn or produce noxious fumes, even in an oxygen-enriched atmosphere.

Durette was selected as a material for Apollo astronaut garments. Subsequently, Monsanto sold production rights for the material to Fire Safe Products (FSP), also of St. Louis. FSP is now producing Durette for a wide range of applications.

An example of a non-aerospace application is shown in the photo above, which pictures a hyperbaric chamber at the University of Pennsylvania Medical Center's Institute for Environmental Medicine, Philadelphia, Pennsylvania. Known for its research on deep diving and oxygen therapy, the Institute is one of several hyperbaric and undersea medical centers that use Durette fabrics for safety.

® Durette is a registered trademark of the Monsanto Company.

Pressure chambers are employed for treatment of a number of conditions which respond favorably to oxygen at elevated pressures, including divers' decompression sickness, or "bends," chronically-infected non-healing bone fractures, carbon monoxide poisoning and gas gangrene. In the chamber, the patient breathes oxygen at about twice normal atmospheric pressure. The



increased fire risk of the hyperbaric environment is offset by reducing the amount of combustible material in the chamber through use of Durette in sheets, patients' garb and attendants' uniforms. For similar reasons, Durette is used in crew clothing, furniture and interior walls of diving chambers operated by the U.S. Navy and a number of oceanographic companies and research organizations.

A different type of Durette usage is illustrated in the photo at left, taken at an auto raceway in Riverside, California. In auto racing, fire is a hazard not only in track accidents but also in pit-stop refueling operations; in the photo, the driver, refueler and crew chief are wearing Durette suits made by Pyrotech Safety Equipment, Minneapolis, Minnesota from material supplied by FSP.

FSP's most recent product is Durette bags for filtering gases and dust from smelters, boilers, electric generators and similar systems. Durette felt bags are part of the Kice Hi-Temp Filter connected to the "cupola"—a large coke-burning furnace—shown below. Produced by Kice Metal Products Company, Inc., Wichita, Kansas, the filter cleans cupola emissions by removing pollutant particles from the hot smoke. Kice Metal Products states that the Durette bags can operate at more than 500 degrees Fahrenheit and that the only other felted fiber capable of operating at that temperature costs twice as much.

